

JULY 1950 1/6

le

GEOGRAPHICAL MAGAZINE



MOTOR UNION INSURANCE CO. LTD.
All Classes of Insurance Transacted

10 ST. JAMES'S STREET, LONDON, S.W.1





A wider choice . . .

CONTINENTAL HOLIDAYS
FROM £21-18-6 TO £76-13-0

TWO WEEKS' HOLIDAY INCLUDING TRAVEL,
HOTEL ACCOMMODATION, GRATUITIES, ETC.

When going abroad this year, you can't do better than choose one of Cook's many Continental Holidays—all designed to give you comfort, good food and as much spending money as possible from your allowance.

Isle of Walcheren	-	£21.18.6
Ostend	- - -	£22.13.6
Lucerne	- - -	£38.19.6
Nice	- - -	£39. 7.6
Chamonix—Mont Blanc		£39.11.0
Ideal Escorted Tour of Switzerland	-	£72. 3.6
Ideal Escorted Tour to the Five Capitals	-	£74. 7.0
Ideal Escorted Tour to Italy		£75. 9.0
Milan, Venice, Florence and Rome	- - -	£76.13.0

COOK'S

WORLD TRAVEL SERVICE

Dept. HOL/25/AF, Head Office, Berkeley Street,
London, W.1 or Branches (or any office of Dean
& Dawson, Ltd.)

CARRY YOUR SPARE CASH IN COOK'S TRAVELLERS
CHEQUES.

Not so funny for Mr. Nash!

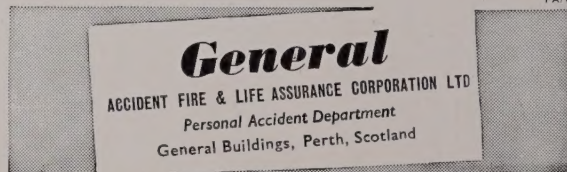
Mr. Nash's sudden transformation from a dignified business man to a sprawling figure of waving arms and legs struck some passers-by as funny. But when he was helped to an ambulance with an injured back and head, Mr. Nash could hardly be blamed if he did not share the joke. He was unable to work for many months, while expenses mounted. Yet he was able to convalesce with an easy mind, for under his 'General' Personal Accident Policy he received £10 a week until he was fit.



**Peace of
mind costs
very little**

£4 a year covers you for £10 a week accident benefit. Are you wise to face the risk — and all that it means to your dependants — *without* this cover? It's worth while finding out more about this and other benefits of the 'General's' Personal Accident Policies—just send the coupon.

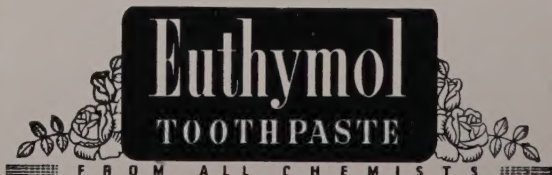
PA/6



FAMOUS FOR ALL CLASSES OF INSURANCE



For
Morning Freshness



A PARKE-DAVIS PRODUCT

An International Expedition to Antarctica

The Voyage to Queen Maud Land

by E. F. ROOTS

A first contribution of £2000 was made from the Geographical Magazine Trust Fund towards the cost of the preparatory work for this expedition. Its background and its scientific programme were described in our November 1949 number by the Director of the Royal Geographical Society. The senior geologist, who is a Canadian, continues its story in the following exclusive article

AN Antarctic expedition may, perhaps, be said to 'start' several times before it is finally in operation. Any expedition rightly begins when the decision to undertake it is made and means are found to carry out that decision, for the preliminary organization of an expedition is as much a part of modern scientific exploration as the field-work itself. The Norwegian-British-Swedish expedition to Queen Maud Land is no exception in this regard; the work of planning and preparation had been going on at an ever-increasing tempo since 1946. These preparatory steps culminated in the sailing of the expedition ship *Norsel* from London on November 23, 1949. In some respects the expedition might be said to have started on that date; but several critical stages lay ahead before the actual work of the expedition, the scientific researches in Queen Maud Land itself, could begin. The present article is written on the eve of the departure of the *Norsel* from the shore of Antarctica, and will attempt to record some features of the end of the crucial preliminary stage—the trip south and the landing in Antarctica.

An advance party, consisting of five members of the fifteen-man wintering party, sixty-two dogs, and some heavy mechanical equipment including three amphibious tractors or "weasels" and the drilling machine for extracting cores of the Antarctic ice-cap, had left Norway one month earlier in the 23,000-ton whaling factory-ship *Thorshovdi*. The expedition was divided into two parts for the journey to southern waters in order to provide better accommodation for the dogs during the long sea voyage, for quarters on the *Norsel* would of necessity be very cramped. It was also desirable to avoid excessively overloading the *Norsel* during her passage through the Southern Ocean storm-belt—the notorious

"roaring forties" and "furious fifties". It was arranged that the *Norsel* should meet the *Thorshovdi* on the whaling grounds somewhere near the edge of the pack-ice, take aboard the men, dogs, and equipment, and then begin the critical task of finding a way through the pack-ice and effecting a landing on the shores of Queen Maud Land.

From the beginning, the five men on the *Thorshovdi* were busily occupied in caring for the dogs. Twenty-two of these dogs had been brought from the Falkland Islands Dependencies, and were of Labrador stock; twelve came from Spitsbergen; and twenty-eight from Greenland. Unfortunately, some of the Greenland dogs had a mysterious paw disease, which had caused two of the animals to be destroyed before the ship left Norway. This disease could not be identified; it appeared to be unaffected by any form of treatment applied, and finally spread to the Spitsbergen and Falkland Islands dogs. Shortly after the *Thorshovdi* had left Curaçoa, Dutch West Indies, bound for Grytviken, South Georgia, more than one-third of the dogs had the disease in some form, and eventually it was necessary to kill eighteen in an attempt to prevent further outbreaks. Considerable concern was felt over the loss of indispensable dog-power; if the loss continued, the field-work on which so much of the scientific programme depended would be seriously curtailed. However, the disease appeared to have run its course, and when, in early December, the *Thorshovdi* had left Grytviken and arrived at the whaling grounds, only a few mild cases remained. Fortunately the disease did not appear to be painful, although this in itself made diagnosis difficult.

As soon as whaling operations were started by the *Thorshovdi*, the members of the expedition began the laborious task of making dog-



All photographs, except four, from members of the Norwegian-British-Swedish Expedition to Queen Maud Land

After loading at Gothenburg, Oslo, and London, the expedition's ship Norsel put in at Cape Town where one of its two Auster aircraft was assembled and mounted on the crate containing the other

pemmican from ground whale-meat, maize-meal, and whale-oil, and of cutting and drying whale-meat to be used at the base. In all, 5400 two-pound bags of dog-pemmican were prepared, and seventeen tons of whale-meat cut and hung. During this time, also, the tracks of the weasels had been reinforced, and the machines otherwise prepared for heavy-duty work on rough snow terrain.

In the meantime, the *Norsel* had loaded at Gothenburg, Oslo, and London, and sailed for Cape Town. On board, in addition to the experienced ice skipper, Captain Guttorm Jakobsen of Tromsø, Norway, four officers and a crew of eleven, were nine members of the expedition wintering party, a five-man Royal Air Force "Antarctic Flight" commanded by Squadron Leader G. B. Walford, and an official photographer from Crown Film Unit of the British Central Office of Information.

Expedition ships are traditionally overloaded. The capacity of the 165-foot, 600-ton *Norsel* amazed most of us; but such is the quantity of materials, stores, and equipment needed to build a base and maintain a self-sufficient community engaged in various forms of scientific research for two and a half years that, in addition to crammed holds, a large amount of cargo was carried on deck. The most conspicuous item of deck cargo was a crate, filling almost the entire afterdeck, and so neatly fitted that it looked like part of the superstructure of the ship itself. The crate

contained a specially 'winterized' Auster Mark VI aircraft, fully assembled except for the attachment of the wings. A similar aircraft was carried, dismantled, in a smaller crate nearby. At Cape Town this second machine was assembled and mounted in the open on top of the large crate.

The party was joined at Cape Town by Major J. A. King, of the South African Meteorological Office, and Mr P. G. Law, the officer in charge of the Australian National Antarctic Research Expedition, who were accompanying the ship's party as official observers for their respective governments.

The *Norsel* left Cape Town on December 28, carrying an additional load of petrol and stores, and encountered the first storm of the "roaring for-

ties" on New Year's Eve. By steering due south the track of local storms was rapidly passed through, and in four days slightly calmer waters were reached. The ship's course was then set westward to meet the *Thorshøvd* in the Scotia Sea. On January 5 Bouvet Island, an impressive white dome edged with coastal cliffs of delicately-tinted blue ice and sinister-appearing dark rock, was passed, making a fitting introduction to Antarctic landscapes. The first icebergs—large tabular masses with remarkably flat tops and vertical sides, commonly seamed at the water-line with dark grottoes or immense blue caves and arches into which the *Norsel* could have sailed—appeared near Bouvet Island. Thereafter the *Norsel* was rarely out of sight of ice.

We sighted land again on January 10, when the ship passed through the remarkable arc-shaped chain of islands forming the South Sandwich group. Like Bouvet Island, these islands are volcanic peaks and, like it, are almost completely ice-covered, with undulating snowy slopes or rugged, crevassed glaciers ending in vertical blue cliffs at the water-line. In contrast, however, to the massive irregular dome that gives Bouvet Island the appearance of a rough, icy fist thrust forcibly upward from the bottom of the Atlantic, Saunders Island, to port of the *Norsel's* course, and Candlemas Island, to starboard, rise in smooth concave cones to



A. J. Thornton



Fifteen days after leaving Cape Town, on January 12, 1950, the Norsel met the whaling factory-ship Thorshøvd (above), though a swell prevented her coming alongside until two days later. Two sixty-foot air-inflated Fin whale carcasses were fastened to the Norsel to act as buffers and the trans-shipment of men, dogs, and materials took place without mishap. To test the arrangements, the first item lowered to the Norsel was (left) the glaciologist's heavy boring machine

small, symmetrical summits, which, partly hidden in cloud and seen white against a dull grey sky, reminded one of an abstract bas-relief of Mount Fujiyama done in alabaster. Each of the South Sandwich Islands that we saw had small areas—capes, low hills, or irregular plateaux—free of ice and snow, probably mainly because of volcanic warmth in the ground. Vapours were seen to be issuing from a cinder cone about 700 feet high on Candlemas Island.

During the voyage from Cape Town the members of the expedition carried on various activities according to their interests and training. A daily weather map was prepared of the Southern Ocean between Cape Horn and Heard Island (about latitude 53° S, longitude 73° E on the Indian Ocean side of Antarctica). This map was based on information received from South Africa, various whaling factory ships, the Falkland Islands Dependencies bases, the Australian meteorological

station on Heard Island, and observations from the *Norsel* itself. The frequency and distribution, and the characteristic shapes, of icebergs were noted, and on many bergs measurements were taken to enable their size and height to be calculated. Later, when in the pack-ice, a 24-hour ice watch was instituted, and the density, thickness, and texture of the pack, and the type of ice composing it, were recorded in detail. One of the most absorbing pastimes of any ocean cruise is bird-watching, and all members contributed to a bird-log in which the appearance and abundance of different species of seabirds were recorded. In all, more than twenty-six varieties were identified.

We met the *Thorshovdi* on January 12, but a swell prevented the *Norsel* from coming alongside until two days later. The transshipment of men, dogs, and materials from the large, relatively stable factory-ship to the small, bobbing *Norsel* was a rather delicate

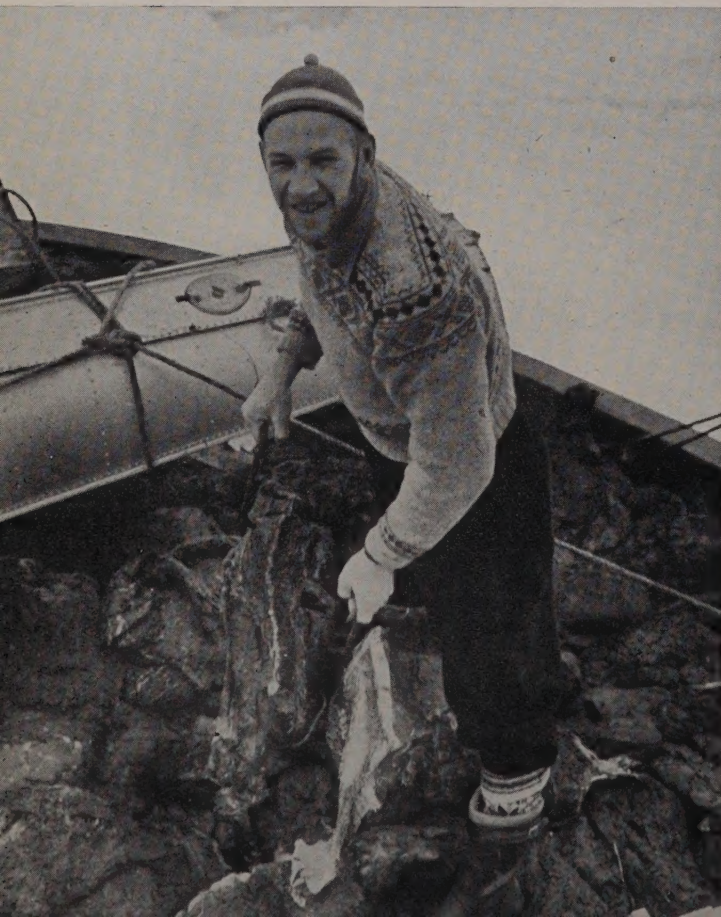
The Norsel went on south-eastwards and soon the sight of pack-ice aroused the dogs. The ship carried forty-two; "thirteen were once counted curled up asleep on a single tarpaulin-covered weasel"

J. A. K.



operation. Two sixty-foot air-inflated Fin whale carcasses were brought by the factory's tender and fastened alongside the *Norsel* to act as buffers; with these in place, the *Norsel* was tied to the side of the *Thorshovdi* in such a way that she could roll and pitch independently of the larger ship. The small deck space on the *Norsel* was further limited by the amount of deck cargo already carried; and it is a tribute to the skill of the *Thorshovdi*'s craneman, who had to land, for example, a heavy weasel on a single hatch-cover which rose and fell as much as fifteen feet relative to the crane, that the entire transfer was carried out smoothly, the only loss being one spare weasel track. The seventeen tons of whale-meat for use at the base were thrown over by hand. When loading was completed, dogs and men were transferred, the whale carcasses were delivered back to the *Thorshovdi*, and after a long blast on the whistle, the *Norsel* sailed away to the south-east. Within a few hours it had entered the fringes of the pack-ice. "Now" said glaciolo-

Nils Roer, the expedition's Norwegian surveyor, surrounded by the whale-meat which covered most of the Norsel



gist Valter Schytt "we can start."

All members of the expedition were now together for the first time. The original wintering party comprised six Norwegians, four Swedes, and four Britishers. The Norwegian contingent consisted of: Captain John Giaever, leader; Nils Roer, surveyor; Egil Rogstad, radioman; Peter Melleby, dog-driver; and Schjölberg Nilsen, cook. Sweden was represented by Valter Schytt, senior glaciologist; Gösta Liljequist, meteorologist; Ove Wilson, physician; and Bertil Ekström, mechanic. The British party of two Englishmen, an Australian and a Canadian, included Gordon Robin, physicist; Charles Swinbank, assistant glaciologist; Alan Reece, assistant geologist; and myself, senior geologist.

Twice previously it had seemed that the loading of the *Norsel* had almost reached its limit—in fact, the cargo was becoming stratified, each higher layer corresponding to a successive port at which the ship had called. After leaving the *Thorshovdi* the upper surface of all decks was once again transformed. Dogs

were chained to every conceivable position on the cramped, cluttered boat deck: to ventilators, skylights, piles of sledges, winches, hatch-coamings, lifeboat-davits and railings. Twenty-one dogs were allowed to run loose on the foredeck, which carried the three weasels and was piled above the gunwales with lumber, spare mechanical parts, drums of petrol and cases and bags of dog-food. Only their sure-footedness and, above all, their good behaviour even though occasionally drenched with icy salt water, kept the dogs from falling overboard. Thirteen were once counted curled up asleep on a single tarpaulin-covered weasel.

Almost all other parts of the ship and cargo exposed to air were covered with whale-meat. Seventeen tons is quite a lot of meat, and when spread as thinly as possible to dry and cure, what had once been merely a cargo-cluttered sealer took on the gory appearance of a mediaeval slaughter-house. There was meat on the oil-drums around the sternpost and on the well-deck, on the aircraft crate and on piles of sledges, lining the floor of passageways between the boats, in the dories, and even covering the roof of the wheel-house. From the crow's-nest little could be seen of the *Norsel* except dogs, meat,



One of the Norsel's stops in the pack-ice was made for the purpose of picking up, much against his will, the Adélie penguin which Swedish meteorologist Liljequist and seaman Nilsen are holding

and one canvas-wrapped aeroplane, blackened with soot from the almost-hidden funnel.

The pack-ice off the coast of Queen Maud Land and in the Weddell Sea varies from year to year, and details of its distribution and extent are imperfectly known. However, it has become established that, in the Antarctic summer, the main belt of pack near the coast of Queen Maud Land—usually about 150 miles wide—moves westward, into and around the Weddell Sea. An irregular tongue of eastward-drifting pack streams out of the west side of the Weddell Sea, usually passing just to the south of the South Orkneys and South Sandwich Islands. It was parts of this tongue that we met soon after leaving the *Thorshovdi*. However, most of the pack in this area was found to be relatively open, and the *Norsel* was able to work eastward approximately along the 60th parallel of latitude until, three days later, we reached open water with comparatively little ice. Good pro-

gress was made for the next three days, with only occasional belts and patches of cake and "growlers" (small thick floes or broken bits of bergs nearly awash) to be negotiated. Somewhat heavier ice was encountered about latitude 65° S on January 19, and the ship's course became very erratic. The pack had a strong westerly drift, and it was apparent that the main belt of ice moving into the Weddell Sea had been reached.

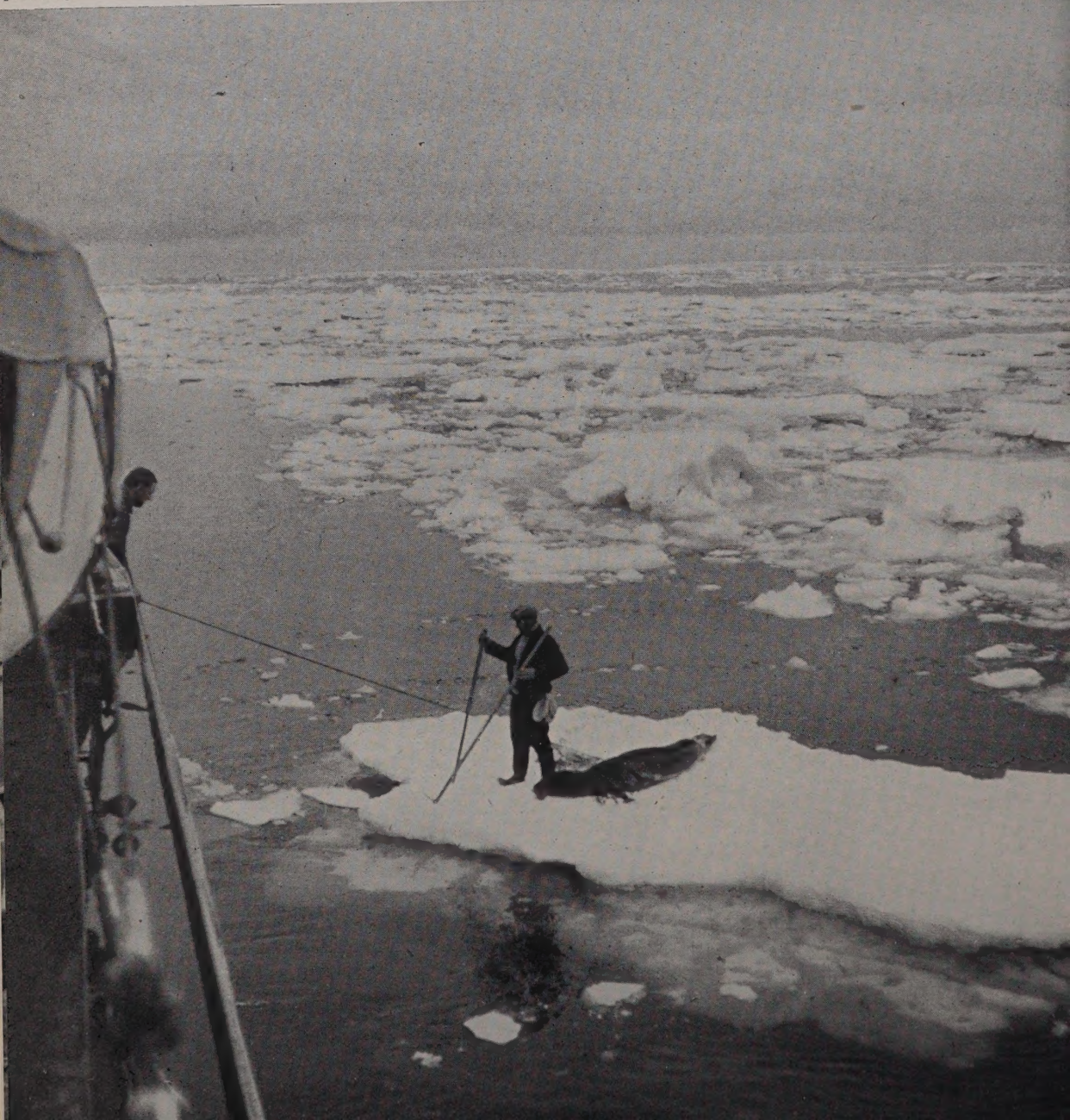
On January 21 the first solid pack of the voyage was entered, and the ice-breaking qualities of the *Norsel* were displayed for the first time. A brief stop in this ice provided a welcome opportunity to stretch one's legs and walk across the pack to make the acquaintance of a Crab-eater seal, which showed considerable annoyance at being the object of so much attention. Several hours later the ship stopped again—for an Adélie penguin. The little fellow waddled and tobogganed frantically across the ice like

a portly gentleman attempting to act buffoon, pursued by the cameraman and one of the crew—who lost his sea-boots in the process and continued in stockinged feet—but was finally captured and brought back to the ship, unhurt and squawking like a farmyard duck. Getting our unwilling guest aboard the *Norsel*, across a narrow lane of slush-filled water, presented a bit of a problem; finally the penguin was dressed in a big woollen

sweater and handed across, amid much hilarity, like a cantankerous and unwanted baby. Once released, our temporary mascot drew himself up to his full twenty inches on the quarterdeck, and squawked defiance at all intruders. After being duly photographed and introduced to those on board, he was given the freedom of the ship, and a short time later jumped out through the scuppers and bobbed away, still muttering his resent-

While working its way south through the pack-ice, the Norsel was obliged to make frequent if temporary halts, during which, among other activities, seals were killed and butchered for dog-meat

J. A. King





"The Norsel came to an expanse of densely-compressed pack, whose seaward edge was as sharp and continuous as the shore of a lake . . . The pack had the consistency of a thick lumpy porridge . . ."

ment at being laughed at.

As was to be expected, the wild life on the pack was not abundant, but was fairly evenly distributed. We saw several seals—Crab-eater, Leopard, and, later, Weddell and the rare Ross seal—each day that the ship was in the ice, and Fin and Killer whales were not infrequent in the clearings. Snow petrels, Antarctic petrels and terns commonly accompanied the ship; Adélie or Emperor penguins were passed every few hours.

The crossing of the Antarctic circle was marked with appropriate ceremony on January 21. The voice of the Spirit of the Ice—with an unmistakable southern hemisphere accent—croaked through the ship's loud-hailer, calling all men who were entering the sacred waters for the first time to gather and receive instructions from the Guardian of the Barrier. The Guardian of the Barrier appeared, dressed in a "snowy mantle" and wearing the medallion of his office, a design of two penguins and the Southern Cross with a pendant symbolizing

a well-known Scandinavian beverage, and read—in a different but also unmistakable southern hemisphere accent—the "Epistle" to the "barbarians" who were to be initiated into the Frigid Brotherhood of the Antarctic Circle. The barbarians were advised how to conduct themselves and were then led before the Spirit of the Ice, where they read a pledge forswearing the iniquities of civilization, renouncing women and their works, and reaffirming their faith in dogs and mistrust of machinery. The seal of admittance was administered by the bitch Sally, a native of Antarctica, who dipped a forepaw in seal blood and placed her sign upon each new member of the Frigid Brotherhood.

The struggle to penetrate the main belt of pack-ice guarding the coast of Queen Maud Land began in earnest in the evening of January 22. After cruising southward for several hours in completely ice-free water, the *Norsel* came to an expanse of densely-compressed pack, whose seaward edge was as sharp and continuous as the shore of a lake.



"No open water whatever was to be seen in the tightly-packed mass of floes and brash-ice which stretched to the horizon ahead and to either side. . . The ship therefore lay to for the night. . ."

No open water whatever was to be seen in the tightly-packed mass of floes and brash-ice, which stretched to the horizon ahead and to either side. The ship doubled back along the edge of this pack for several miles before turning east and then south. The pack had the consistency of a thick lumpy porridge or concrete, the floes and cakes of ice being embedded in a matrix of stiff, pasty sludge, much like bricks in nearly-congealed mortar. The ability of the *Norsel* to force its way through this won the admiration of all those who had never before seen an ice-breaker in action, but the going grew more and more difficult, and after a few hours it became apparent that there was little to be gained by continuing. The ship therefore lay to for the night, and the next day worked back to open

water, following the edge of the pack for about 150 miles to the east, when another attempt was made to push south. The ship was then at approximately latitude 69° S, longitude 05° E, and about eighty miles from the coastline as mapped in 1939. Heavy pack was again encountered; after working through it for about thirty miles the *Norsel* once more lay to in calm, brilliant weather and awaited further developments in the condition of the pack.

During these temporary stops, those on board were not idle. Ice was gathered for the ship's water supply; seals on nearby floes were killed and butchered for dog-meat; some meteorological and geophysical equipment was assembled and tested; one of the aircraft was made ready for immediate use; "survival"

gear was tried in practice camps on the sea-ice; and rescue equipment was put in order. There was time for recreation, too: an international ski race was held on the rough sea ice; tilted floes were sought out and tested for their 'downhill' and *slalom* possibilities; impromptu soccer games and track meets were arranged on the floes; and photographers roamed to some distance on foot and on ski, looking for seals, penguins, and especially impressive angles from which to 'shoot' the *Norsel* in the ice.

By January 30 it appeared that the pack surrounding the *Norsel* was becoming more compressed. There seemed little chance of getting through it in this locality and finding navigable water from which to search for a landing-place; accordingly, the *Norsel* retreated north to open water.

A roundabout course was then taken to the west and south, to enter the east side of the Weddell Sea. One of the aircraft was first put into service in this area, operating from clearings of open water between the floes. The careful preparation by members of the Antarctic Flight bore fruit as, with the aid of air recon-

naissance, the *Norsel* was able to work directly south and on the evening of February 3 sailed to the 'barrier' or terminal cliff of the shelf-ice fringing the continent just north-east of Cape Norvegia. Here the barrier is an almost unbroken vertical cliff 50 to 200 feet high, in places undercut at the water-line. From the air it could be seen that in most places flat, featureless shelf-ice extends a score of miles back from the barrier; at Cape Norvegia and fifty miles to the north-east, smooth, gentle domes with an estimated height of as much as 600 feet and a pale brownish colour due to shadows on their wind-sculptured surface, rise behind the cliff. No obvious landing-place was discovered during flights along the edge of the barrier, but a series of four remarkable wedge-shaped valleys or immense cracks in the shelf-ice was encountered. The valleys are ten to fifteen miles apart and roughly parallel. They are up to twenty miles long and two miles wide at the mouth, narrowing inland to a single crevasse. They have vertical walls and relatively flat, highly-crevassed floors that rise gradually from the bay-ice in the mouth of the

When the Norsel entered the Weddell Sea air reconnaissance enabled it to work south through the pack-ice; here one of its two R.A.F. Austers floats outside the 'barrier' or cliff of shelf-ice

G. Jakob



(Below and opposite) *After many fruitless attempts to reach the coast of Queen Maud Land elsewhere, a landing was made to the north-east of Cape Norvegia and the Expedition immediately began to unload equipment. "It would be difficult to conceive a more picturesque setting in which to set foot on Antarctica. The Norsel was lying in 200 fathoms of water in a sheltered corner of an inlet . . . bordered by vertical cliffs of conspicuously layered shelf-ice, whose scalloped and fluted surfaces show every tint from brilliant white to deep glacial blue"*

7. A. King





valley to the surface of the shelf-ice at its head. Two of these valleys were investigated by the *Norsel*; they offered possible but not very practicable landing-places. Before continuing the search for a landing in this area it was decided to reconnoitre the coast still further to the south.

Land-fast bay-ice and increasingly heavy pack guarded the coast south of Cape Norvegia, however, and when aerial reconnaissance south of Seal Bay showed the ice-cliff to be unbroken, guarded by large areas of bay-ice, and the pack to be extremely difficult for navigation, it seemed fruitless to continue. The *Norsel* accordingly turned about at latitude 72° S, and on February 8 reached the navigable pack close to the barrier north-east of Cape Norvegia.

A wind approaching gale force, ably predicted by the expedition meteorologists, prevented close approach to the barrier until February 10. An attractive landing-place, in one of the large wedge-shaped valleys previously discovered but not investigated by the ship owing to heavy pack-ice, was located and carefully examined from the air; the *Norsel* nosed alongside a rounded ramp of snow; and

a reconnaissance party set out on skis to explore the surrounding shelf-ice with a view to determining its suitability as a site for the base for the wintering party. The report was favourable; it was decided to land; and the long southward trip—the maiden voyage of the *Norsel*—was over. Unloading began at once.

It would be difficult to conceive a more picturesque setting in which to set foot on Antarctica. The *Norsel* was lying in 200 fathoms of water in a sheltered corner of an inlet about six miles long and two miles wide. Except for the bay-ice at its head—forming the floor of the wedge-shaped valley that extends more than five miles inland—and the ramp-like snow cushion to which the *Norsel* was tied, the inlet is bordered by vertical cliffs of conspicuously layered shelf-ice, whose scalloped and fluted surfaces show every tint from brilliant white to deep glacial blue. At times, as when the *Norsel* entered, the inlet is completely free of ice; at other times it is so filled with pack-ice as to make one wonder how a ship could ever make its way in—or out again. One of the horns of the inlet rises above the general level of the shelf-ice to a



(Above) Whilst Maudheim was being built, the two Auster aircraft of the R.A.F. Antarctic Flight, fitted with skis, operated from the shelf-ice to investigate the structure and pattern of the surrounding region.



(Below) Sites were excavated for the wooden huts, whose pre-framed sections can be seen in the background



(Above) A pause during the building work at Maudheim, with a living-hut almost complete. The tracked snow-vehicle in the centre is one of the expedition's three weasels, used to drag sledges carrying heavy gear.

(Below) The wintering party gathered near the Norsel just before her departure from Queen Maud Land



sharp, slightly overhanging point, resembling the prow of a yacht, forming a conspicuous landmark visible from both out to sea and 'inland' on the shelf-ice. The ramp on which the *Norsel* discharged forms a one-sided subsidiary valley, bordered on the north-west by an ice-cliff as much as fifty feet high, and sloping gently up to the surface of the shelf-ice to the south-west and south. Approximately a mile from the edge of the inlet the shelf-ice levels out to a featureless plain about 140 feet above sea-level. The base was established on this plain about two miles from the unloading point. Named "Maudheim" in honour of the Queen of Norway, it was to consist of two 24-foot-square bungalow-style living-huts, a smaller hut to house the Diesel-motor generator unit, huts for the "rawin" meteorological apparatus and the boring machine for glaciological investigations, and the large aircraft crate, converted to a general workshop and laboratory hut.

Favoured by mainly clear, relatively calm weather and invigorating temperatures ranging from -4°C to -18°C , the work of establishing Maudheim went on apace. Equipment, supplies and materials were unloaded directly from the ship onto heavy-duty goods sledges and hauled by weasel to the base. The weasels proved admirable for this purpose, and hauled a payload of $1\frac{1}{2}$ to 2 tons up a gradient of 1 in 200 through relatively soft snow from the ship to the base in about twenty minutes. In four days, most of the 350 tons of stores had been unloaded from the *Norsel* and deposited at Maudheim.

Meanwhile, the base was rapidly taking on the appearance of an organized community. The huts were entirely pre-framed, though not pre-assembled, and once the sites were excavated and the foundations levelled, building was largely a matter of fitting together timbers and strips of planking. The framework of the first living-hut was complete by February 14; and four days later the exteriors of both living-huts and the motor-generator hut were complete, and the crate hut set in place. After the ship was unloaded members of the *Norsel's* crew aided the expedition members in hut-building.

While the unloading and house-construction was in progress, the Royal Air Force Antarctic Flight took advantage of the fine weather to investigate the surrounding region. Both aircraft were fitted with skis and operated from the shelf-ice near the unloading point and near Maudheim. The immediate vicinity of the base, the coast line, and the plain of shelf-ice lying between the base and

the rising ground inland were carefully examined in order to learn something of the structure of the shelf-ice, and to detect crevasses and their pattern. Longer flights were made to the south-east over the area that the summer sledge-parties would have to travel to reach the inland mountains. Outstanding among the many valuable results of these flights was the locating and first close investigation of what appear to be the Kraul Mountains in latitude $74^{\circ} 05' \text{S}$, longitude $13^{\circ} 04' \text{W}$.

The aerial observations of the environs of the base were supplemented by ground investigations. The local crevasse system was mapped in a preliminary fashion; crevasses near the weasel road were examined, marked, and their bridges partly dug out; and a ski journey was made to one of the large wedge-shaped valleys in an attempt to gain information regarding the permanence of the shelf-ice in the area. In general, these investigations have disclosed that the seaward edge of the shelf-ice seems to be relatively stable, with no significant line of weakness near the base.

A change in the personnel of the expedition wintering party was arranged during this period. Corporal Leslie Quar, R.A.F., was added to the party as radio technician. Schjölberg Nilsen was obliged to retire from it because of ill-health, and his place as cook was taken by John Snarby, the *Norsel's* steward.

By February 18, three months and four days after the *Norsel* left Gothenburg, Maudheim was sufficiently complete to be occupied. A halt was called in the building, and all members spent their last day on the *Norsel* attending to personal affairs. It was planned that the *Norsel* should depart on February 20, leaving a harmonious and already well-knit group of men, speaking a curious and often hilarious mixture of Scandinavian and English, to spend a very busy two years in surroundings as clean, as inspiring in their mixture of complexity and magnificent simplicity, and as awing in their uncompromising harshness, as those to be found anywhere.

The men at Maudheim do not claim to be either explorers or adventurers, and indeed are inclined to view most adventures as misadventures and therefore evidences of incompetence for the job we have to do; but we look forward to the next two years, confident that they will be memorable years, convinced that the interesting, absorbing work we are doing is eminently worth-while, and humbly grateful for having been given the opportunity of being where we are, doing what we are.



All photographs by George Pickow from Three Lions

Cork Harvest in Portugal

Cork is the bark of an evergreen oak (*Quercus suber*) which grows in the south of Europe and on the North African coasts generally, but is principally cultivated in Spain and Portugal. By annual additions from within, the bark gradually becomes a thick soft homogeneous mass made up of innumerable airfilled cells, a construction which accounts for the compressible, light, elastic, insulating, air- and water-proof qualities that make cork economically valuable.

The bark is first stripped when the cork-oak is fifteen to twenty years of age and then every eight to ten years. Quality improves with each stripping, but only with the third or fourth is the cork suitable for its widest range of uses. Because the cork-oak does not carry its sap under the bark, the operation does not affect its life (150 years and more). Stripping-time is July and August, when families of Portuguese go to the cork forests and help with the harvests



To remove the cork, cuts are first made right round the trunk, these are then connected by longitudinal cuts and the bark is easily prised off. Care is necessary as too deep a cut may harm the next crop

Harvesters, who work and sleep in the forests, provide themselves with a storage space for necessities by making one longitudinal incision in removing the bark, which then resumes its cylindrical shape





Finally the bark is piled, a high but light load, onto oxcarts and cork sets out on the first leg of the journey at the end of which a corkscrew lies in wait. Though it is so commonly used as a stopper or bung that its name denotes a function as much as a material, its employment does not end with bottle-necks; it is found in fishing-nets, shoe-soles, hat-linings, artificial limbs and architectural models. Ground small and heated, its natural resin alone causes it to combine into uniform sheets and blocks, durable as hardwood and more resilient



All photographs by Roger Coster from Toni Muir

Haitian Dancer

Notes by IVAN T. SANDERSON

The dances seen today in Haiti are of three kinds: modern ballroom dancing, folk-dances and traditional ceremonial routines. The first is simply that common to the whole modern world, the second is peculiarly Haitian and the third is more analogous to a religious procession but moving in all directions at once. Only the last accompany the ceremonies of Vaudun (commonly called Voodoo) which stem from Africa and have each a special routine for the particular god to be venerated. The folk-dances all have their specific movements; among the dances of these village social festivities are the Danse Martinique, the Danse Guinée, the Bambosha, the Si-yey or "sawing dance" and—

—the Congo. One of the movements of this dance is called the “paillette”, meaning the “disdain”, here admirably illustrated by the dancer. It consists of various shrugs and disdainful gestures signifying that the girl does not welcome her partner’s advances. Its outcome is, however, the usual feminine consent to proceed with the dance





photographs by the author

The Great Northern Diver, whose unearthly cries have earned for it the appellation of "the Loon"

The Loon and Some Icelandic Neighbours

by G. K. YEATES

VOLCANIC Iceland is a country of contrasts. Glacier and volcano have made it, and Vatnajökull and Hekla show that today the forces of fire and ice are still actively engaged in shaping the face of the countryside. Their past conflicts have produced a barren land of lava mountains and deserts, usually bereft of anything but the most meagre vegetation. Only in the hollows and valleys caused by extensive land-subsidence and on the flat plateaux between the mountains, smoothed by the passing of the glaciers, can the land boast of any greenness. For here the water from the melting of the winter's snow-cover lies, and does not drain rapidly off down fast-flowing salmon rivers, or through the porous dust of volcanic deserts. Lakes are

born, and between them extensive bogs. The main lake-area of Iceland lies in the vast moorland north and west of Eriksjökull, where there is a great inland sea of waters. The two best-known lakes of Iceland, however, lie out of this region and more on the beaten track. Thingvallavatn in the south-west is the largest sheet of water in the country, while Mývatn in the north-east is a famous beauty spot and summer resort.

To these waters, big or small, remote or accessible, comes in summer a host of birds. Mývatn indeed can boast of more breeding species of ducks than any other European lake. A mere list suffices to make an ornithologist's mouth water—Mallard, Gadwall, Wigeon, Teal, Pintail, Shoveler, Scaup,



(Above) *The Red-throated Diver, more common than the Great Northern, is found throughout the Arctic. In plumage it is quieter than its kinsman, but in noise just as loud. (Below) The Black-tailed Godwit has gained pride of place on the bogs of Iceland, whose remote mountain valleys enhance its beautiful plumage*



Tufted Duck, Long-tailed Duck, Barrow's Goldeneye (*lovely bird*), Common Scoter, Goosander and Red-breasted Merganser—thirteen different species; and on the river nearby bobs in the turmoil of the waterfalls that exotic duck of the New World, the Harlequin in its fantastic dress of blues and reds, browns and greys, a creature as unexpected in these northern wastes as it is welcome. For it and Barrow's Goldeneye the European ornithologist must visit Iceland, for only there, outside North America and Greenland, do they breed.

The same is true of that most magnificent of all the water-birds of the north—the Great

Northern Diver. Its wild demoniacal shrieking rings over the wilderness of Iceland, as over the silences of the American backwoods. To the Icelandic farmer it is Himbrimi; to the Canadian trapper it is the Loon. To both it means spring and the end of winter, for when the big Diver, in all the grandeur of its summer plumage, returns to the inland waters the ice is gone, and the sap is rising in the diminutive birch and dwarf willow scrub around the lake.

It would be difficult to find a nobler harbinger of summer than this great water-bird, riding its native lake like a battleship, clearly visible a quarter of a mile or more

The Whooper Swan "is as wild as a goose and retires into remote lakes to breed". Conspicuous and conscious of it, it will leave its nest as soon as a human appears in sight, even if a mile away





An Icelandic lake with a shore-line of at least fifty miles and, in the foreground, a nesting-islet of Great Northern Divers. The hide on the right was later moved onto the island itself

away. Its dress almost defies description, though it is simple enough, with nothing of the Harlequin's pantaloony patterning. Black and white in rings and spots and squares cover the bird in chess-board style, and both sexes wear similar plumage, the only difference between them being size, especially of the head and massive bill of the male.

The noises which issue from this bill are unearthly. There is a frequent, often-repeated flight-note, a high-pitched *hoo-hoo-hoo*, with a slightly idiotic ring about it, but the full 'song' of the Loon is an uncanny wild yelling in unison, made both afloat and flying, which is like the satanic laughter of all the madmen in hell.

When the distended torsos of the budding angelica shoot through the earth of the islands in the lake and the sprigs of the dwarf willows are rusty-brown with new growth, a nest is made—a huge flattened scoop in the wet earth near the water's edge—never far, for the Loon is adapted for swimming, not walking, and his back-set legs accord ill with land-lubbering. Here in late May two big

elongated brown eggs are laid from which over a month later two black golliwogs, able swimmers from birth, will emerge.

The Great Northern is not the only member of its tribe in Iceland. Indeed, it is far less common than that wide-spread species, the Red-throated Diver. The Red-throat is found throughout the Arctic and is equally at home in the tundras of North Russia and Alaska as on the Canadian barrens or high *fjalls* of Scandinavia. Not satisfied with this circumpolar distribution, it breeds through many degrees of latitude—from Donegal in Ireland to the very farthest limits, towards the Pole, of land free from perpetual ice. In the many small tarns of Iceland the Red-throat, which incidentally the Icelander calls *Lomur*, the loon, abounds.

In North Iceland it is a poor square mile that does not harbour several pairs. And if in plumage its subdued browns and grey head must give place to the *Himbrimi*, in noise the Red-throat almost rivals its kinsman. Deep, guttural croakings and wild laughing accompany birds flying out to sea to fish, or pairs

courting in mysterious aquatic dances on the home waters. Lomur can afford to laugh. Few species are more prolific.

The Divers hold pride of place on the Icelandic lakes, though the Ducks far outnumber them. There are however two birds, which in a less obtrusive manner, are representative of these upland waters. All the wild geese of our winter coasts go north to breed, trying it seems to reach the Pole itself, but two breed in Iceland: the Pink-footed Goose in the central lava desert—it is a bird of cliffs rather than marshes, and, on the lakes, the Greylag. Our domestic goose derives from the latter, though no-one knowing this bird in its wild state would suspect it. Indeed, the difference between the constant wariness of the wild bird and the quickly-acquired tameness of the wild-born gosling brought up by man in a farmyard is the measure of this astute bird's intelligence. On the hill-lakes of Iceland it nests in splendid, but ever watchful, isolation.

The Whooper Swan, too, is no tame creature, with arched wings and folded neck, gracing the waters of some ornamental pond. This straight-necked, yellow-billed swan is as wild as a goose and retires into remote lakes to breed. As soon as a human appears on the sky-line, even though a mile away, they will leave their nests, as well they might, for these great white birds can be seen for miles and it requires little more fieldcraft to find the huge mounds of dead grasses which they build for nests.

Whoopers are the very spirit of the Icelandic wilderness. Too often they appear to the layman, even to bird-watchers, as "just swans", a bit, but not much, better than the Mute Swans of river and lake. Those who think so should see a wary Whooper approach its island-nest with the snow-fields on the mountains as a backcloth; or, better still, see cob and pen come trumpeting down the valley from the upland tundra to the feeding lake—in single file, yellow beaks flashing in the sun, now lost in the mountain snow behind, now clear-cut against the dark lava of the hills. . . Or they should see them as they alight, approach each other with dignified ceremony, rise upright in ritual, belly to belly, subside, dip beaks in unison and then go to their feeding. These are the great moments in an ornithologist's life, and they are the purpose—and the reward—of visits to such bird-haunts as Iceland.

One more water-bird must at least be mentioned. In Britain the Red-necked Phalarope is synonymous with rarity. In

Iceland it swarms. Generalizations are dangerous in nature, but it is true to say that it is a poor tarn in Iceland that has not one pair, and most have many. They are most charming birds with their delightful fearlessness, their Joseph's coats of many colours and their engaging way of swimming. They bob like children's toys round the green rushes of the lake's edge, picking up flies and larvae, often at your very feet. Flotillas on migration appear even on the lake in the middle of Reykjavik.

Every sheet of water has its attendant bog, some big, others small. Much depends on the state of the summer. If the thaw is late, great areas will remain in bog-condition throughout the breeding season. The birds of this habitat are in Iceland less easily defined than are the aquatic species. Thus the Red-necked Phalarope, though clearly a bird of the lake, retires to the bog to nest. At the other end, the Whimbrel and Golden Plover of the drier moorland often overlap into the wet areas to nest. The species also vary with altitude. In the marshes of the river estuaries and low ground Redshanks are common—the dark Icelandic sub-species. They are absent from the higher swamps.

Two birds, however, may be regarded—Phalaropes apart—as the typical bog species of Iceland—the Snipe and Dunlin. Wherever there is a wet place in the hills or in the valley, there will be Snipe drumming overhead, or little Dunlin shouting their own importance with that extraordinary breeding-trill which sounds not unlike a policeman's whistle with a pea in it.

Pride of place amongst the bog-birds of Iceland must go to the Black-tailed Godwit, which is confined mostly to the south-west, but which is now spreading up the west-coast marshes. This loud-voiced, long-legged wader with brick-red neck and breast is a glorious sight seen wading amongst the buttercups and marsh marigolds of the lowland farms. We are inclined to think of this Godwit as a bird of the Dutch polders or of the low Swedish marshes. In Iceland it retires into wet places in the hills, and unexpectedly comes shouting defiance and anxiety at you, when your binoculars and thoughts are on a Whooper Swan or Diver. Somehow the Godwit seems out of place there just below the snow-line, but its increase in Iceland is sufficient evidence to disprove this. Certainly it would be difficult to think of any background in which its ruddy plumage could be seen to better advantage than in these remote mountain valleys.



All photographs Crown Copyright

Donkeys in Cyprus

Notes by F. W. SADLER

If the horse is now the plutocrat's plaything, the donkey is the peasant's helpmate—and Cyprus is an island of peasants. This British colony at the eastern end of the Mediterranean has 53,000 donkeys; almost fifteen to the square mile and one to every seven rural inhabitants. In the economy of the island, as indeed in that of Middle Eastern countries generally, it fulfils the task that motor transport and tractors and pumping machinery accomplish in ours—and it costs only £4. It is indispensable in the mountain regions, which it climbs with the spectacular speed and descends with the sure-footedness of a mountain goat and the grace of a thoroughbred horse. Its life-span averages fifty

years, almost twice that of a horse, and one donkey is reported to have lived to eighty-six.

Cyprus has developed a breed that is recognized as one of the finest in the world, famous for its powers of endurance and freedom from disease and able to carry a load of from 168 to 224 pounds and more; a breed which has been much improved by the Government stock-farm at Athalassa near Nicosia. So famous are Cyprus donkeys that many are exported: 1740 in 1949, all after a thorough veterinary examination. Since mares work as hard as jacks and also give an annual increase, the latter are more exported; to offset this the Government rewards owners of high-class jacks who use them for breeding



*Peasants live for their sons ;
in Cyprus they also live by
their donkeys, one of whose
many tasks is to help in draw-
ing the plough, often part-
nered by an ox—and its calf*



The donkey is the favourite means of transport and where pipe-lines are lacking it conveys water in old oil-drums. (In the background is Kyrenia)

Having ploughed the field before the sowing, the donkey helps to dispose of the crop after the harvest; in this and many other ways it is essential to the farmer of Cyprus



Ecuador - Peru - Bolivia

III. Architecture

by GEORGE ROCK

Photographs by A. COSTA

This is the last of three articles on the Andean republics once ruled by the Incas, as seen by Mr Rock and Mr Costa in the course of a recent journey. Preceding articles, published in our May and June numbers, described respectively the landscape and the people of all the three countries

I DID not know what to expect, but I was dazzled. One remarkable sight followed another as Costa and I travelled south through Ecuador, Peru, and Bolivia. The landscape was constantly breathtaking, and I wanted to think its grandeur had inspired the profusion of magnificent building that we saw; but it was also necessary to remember the Counter-Reformation and the history of the Conquest. While indigenous elements often appeared, the few purely Indian fortresses and temples belonged to the realm of archaeology. The most exciting architecture was colonial—reminder of a colony larger and richer than its mother Spain, devoted to collecting gold, silver, and Christian souls for the power and glory of the Spanish monarch.

Victorious Pizarro had sent a captain north to conquer Quito, but news of the bloody happenings in Cuzco had gone ahead of him, and he found the old capital of the Quitu Kingdom razed to the ground. Rebuilding was begun in 1534 under the direction of the religious orders, chiefly the Franciscans, whose artisans trained the Indian labourers. These natives had forgotten their old culture and had not been subjected to that of the Incas long enough to have been overcome by its apathy. They achieved such proficiency in the European mode that in the following century there was a recognizable Quito style to the church paintings and articles of furniture that, shipped to all parts of Spanish America, formed the basis of the continent's artistic development.

To start our sightseeing in Quito, we walked through the narrow streets of the colonial city to its oldest ecclesiastical building (reported to be the oldest of such size on the continent), an enormous block of three churches, seven cloisters, and several garden plots grouped around San Francisco. On the far side of a sloping plaza was a broad rusticated platform of handsome renaissance design and, rising behind this, a simple, almost severe façade which appeared to have been built at several periods. The ground

storey and the central section of the first were of distinctly Italianate mannerist style, with pilasters that practically disappeared behind horizontal bands of rustication. The rest was baroque, topped by a scalloped Moorish cornice which looked like nothing so much as the frill around an expensive box of candy. Two towers rising from the corners had been last rebuilt after the earthquake of 1868, disproportionately small in fear of another quake.

We were shown through the interior by a Spanish *padre* who was studying the archives of the monastery in order to write its history, as he had just done for San Francisco in Lima. Going first to the main cloister, we found again juxtaposition without fusion of the pure Italian and Moorish designs, as in the graceful Tuscan columns supporting stilted Moorish arches of the lower arcade. The padre chain-smoked, using a fancy metallic cigarette-holder, and he pointed with love to every bit of gilt or carving that we passed. Around the walls on the ground level hung a band of large pictures which he explained as an illustrated catechism for the illiterate but suggestible Indians. The old canvas had begun to rot and the frames warped at unorthodox angles, but the fires of hell still burned unmistakably bright.

Fra Jodoco Ricke, a Fleming, had supervised the construction, but there was no indication of the name of the designer. The padre suggested tentatively that the plans had been sent from Rome (we later learned that this was a standard explanation for any such mystery); but consideration of the preponderance of Moorish and original elements in the plan made this seem unlikely. Rome so close to the Renaissance could not have inspired such Moorish details as the ogival arches at the transept crossing, the considerable use of interlacing bands of strapwork and inlaid ornament on furniture and decorative panels, or the magnificent ceilings of rich patterns of blue and crimson and gold, in the blend of Christian and Muslim styles which in

Spain is called *Mudéjar*. The panels above the nave had been covered over, the padre said, because a nobleman had not liked them. I babbled that I had read of their falling in the 'quake of 1868, and the padre shrugged his shoulders wearily as if to say that since the famous ceiling could no longer be seen the manner of its disappearance was immaterial. To console himself for its loss, he told us about the strips of thin gold-leaf between the joints of the rustication on the façade, a survival of the Incaic custom of sealing their mortarless masonry with gold bands.

Among original elements in this church, the padre mentioned the railed porch in front as an adaptation of the early Christian atrium, used here in the early days for hearing the catechism of the many Indian converts. (Elsewhere we saw the railing grown to the proportions of an arcade enclosing a sort of forecourt, a feature traditionally placed before the entrance to a mosque.) However, the greatest innovation was that, for the first

time, all piers, walls, vaults, and ceilings had been entirely panelled in carved and gilded wood, creating an effect of extreme richness. "It is so sumptuous", the padre said with relish as we stood in front of the gold high altar, "it is all so very sumptuous." And we could only agree.

Nearer to the centre of the city was the Jesuit church of La Compañía, built about one hundred years later in the full baroque style. The Jesuit order, founded the year that construction began on San Francisco, was last of the many to reach Quito, and they had to live in borrowed houses until, in the second quarter of the 17th century, they could afford to begin their church. The façade was not completed until the beginning of the next century, and showed a contorted version of the oldest sections of San Francisco—the columns twisted, niches added to hold statues of saints, and the whole covered with bands of delicate low relief of great finish and variety.

The interior was almost oppressively rich, the panelling of San Francisco being replaced by raised stucco designs in gilt over a crimson ground in a pattern resembling the cursive Kufic script of an oriental mosque. Bands of

this complicated decoration covered the piers, ran down the length of the nave, and appeared as panels on the small screened balconies projecting from the transept walls. The whole was much more sophisticated than San Francisco, and of an excellence more consistently sustained, although the supreme moments of the earlier church (such as the row of saints carved by the famous Caspicara) were never equalled, even in the elaborate retables of the transept altars designed by a member of the Spanish family of architects called Churriguera who were responsible for the extravagant 18th-century baroque style known as Churrigueresque.

In spite of these glories, a desire for the Gothic haunted the country. Walking one morning towards the smart new suburbs, we came to the foundations of a new basilica in flamboyant French Gothic. The building when finished would be huge, and, to judge from the similar churches of recent date in Ambato and Cuenca to the south, it would



A. J. Thornton

have no more than its size to recommend it. The very idea seemed preposterous in a city where the only true Gothic was to be found in the ribbed vaults of the churches of San Agustín and Santo Domingo, designed by the Spaniard Francisco Becerra (grandson of the master-builder of the Cathedral of Toledo), who had stopped briefly in Quito in 1581 on his way from Mexico to Peru, where he constructed cathedrals in Cuzco and Lima.

Becerra's cathedral in Lima has been so often shaken by earthquakes that only a wooden replica of his ribbed vaulting remains. When we saw it in 1949, the damage of the great 'quake of 1940 was still being repaired. Other churches in Lima that had already been restored had a curiously unreal air of being too clean and neat and pretty, and whole sections of the city seemed to us to have the appearance of a film stage through which we extras had to move carefully, waiting for the stars to arrive and the cameras to begin their work. More romantic were the vistas of cotton-wool clouds floating across the cobalt sky seen through holes in the roof of San Francisco, still jagged with the torn remnants of Mudéjar strapwork.

Dating from the end of the 16th century, San Francisco is one of Lima's oldest churches, and its façade shows immediately the new character of Peruvian (and Bolivian) baroque, a difference of exterior alone. There is still some mannerism in the absurd camouflage of the rustication, but the building uses the Spanish design of two tall towers flanking a portal as wildly complicated as a baroque retablo in the particularly Spanish manner of Churriguera. Larger or smaller and varied according to wealth or artistic skill, this design remained fundamentally unchanged throughout Peru and Bolivia. Late towers have a tendency to froth at the top, to evaporate in a number of niches and cupolas and turrets so that the clear sky comes neither suddenly nor as a surprise. The screen around the door billows up between the plain bases of the towers in larger repetitions of the same curve, pausing at an elaborate niche holding the statue of the saint of the church, then rising higher to a deep arched cornice, to be topped finally by a cross or the emblem of the church's order. Bands, garlands, roundels and cartouches cover the remaining space with a maze of ornament, in which angels, birds and local animals are almost lost.

Many nationalities went to make up the glittering civilization of the Viceroyal capital in the 18th century. The seat of Spanish rule in America, Lima was highly cosmopolitan

and fabulously rich, romantic and elegant, with a uniquely *criollo* flavour of the exotic which has remained evident in their spiced foods and Moorish houses. All through the old city we saw projecting wooden balconies with screens and lattices, luxuriant adaptations of the Arabic *masrabiyyeh*, covering not just one window but clusters of them, two-storeyed or in a long string on one level, painted a rich chocolate against the prevailing white or grey of the houses. Sometimes elaborately carved, they were still being incorporated into the design of the city's newest buildings. This taste for the Moorish was perhaps carried furthest in the *patio* of the handsome old Torre Tagle Palace, begun in 1715, with its sunken fountain, alternation of large and small arches on the upper arcade, strapwork decoration, and blue and yellow tiles sparkling in the sunlight.

Across the Río Rimac beyond the old walled city, we saw the Quinta da Presa, reputedly built as a country retreat in the last quarter of the 18th century by the Viceroy Manuel de Amat for his glamorous actress-mistress La Perricholi. A narrow stream was diverted from the Rimac to run through a moat in front of the rose-plaster façade, ornamented with heavily-pedimented windows and playfully-bulging balconies. Most of the house was being used as a barracks, but a few rooms were arranged as a museum open to the public, and a large gilded carriage sat on one of the broad terraces overlooking the half-formal, half-rustic garden. From the flat roof we looked down into the laundry courtyard and saw a small grandstand facing a model of war games laid out on a miniature landscape of sea-coast and mountains. When Costa went to look closely at a crescent-topped pagoda and a latticed tree-house, a soldier ran up to tell him that these belonged to the barracks, not the museum, and that he should, please, leave.

On our way to Cuzco, we flew to Arequipa and saw the rich style of Lima's San Agustín transformed by the provincial Indians in the only significant change of the rest of the trip. Smaller churches had only a single tower rising from the corner of a plain cube, but the portal screen was elaborately picked out in a raised white-plaster design against walls of pink or yellow or pale blue, a flat and quite heavy decoration of naively stylized local plants and animals. Walking in the streets, we were frequently charmed by secular bits of this exuberant decoration over the doors of houses. As a touch of whimsy or totemism, rain spouts were shaped to resemble puma or cherub heads.



The Franciscans followed hard upon the Spanish Conquest of the Inca Empire and established a school in Quito to teach the Indians architecture, painting, decoration and sculpture. This School of Quito, as it came to be called, acquired fame throughout South America. Its style was recognizable in the church paintings and articles of furniture it sent to all parts of Spanish America; these formed the basis of the continent's artistic development. The skill that Indian wood-carvers achieved in handling the European style is well shown in this colonial door, said to be the most beautiful in Quito



The Jesuit church of La Compañía de Jesús at Quito, Ecuador, is in baroque style. The façade, completed in the early 18th century, shows Berniniesque columns reminiscent of St Peter's at Rome; with "the whole covered with bands of delicate low relief of great finish and variety". Last of the religious orders to reach Quito, it was only in the second quarter of the 17th century that the Jesuits could afford to have their own church; the Franciscans, on the other hand, arrived soon after the Conquistadores and built San Francisco (one of the largest, and the oldest of its size, in South America) in 1534



"In the attempt to convert the Indians by converting their sacred places", and to impress them with the might of Spain, the Spaniards built lofty and richly-adorned churches on the sites of Incaic temples and palaces, mostly using the stones dressed by Indian craftsmen in bygone days; and their baroque over-elaboration of detail appealed to the Indian taste. Witness "the towers pierced by oval windows and topped by a froth of little cupolas and turrets" of the Jesuit church of La Compañía de Jesús at Cuzco, Peru. Once part of the Jesuit monastery, the cloister now belongs to the University of Cuzco



At Cuzco, the ex-capital of the Incas, "one afternoon we came across a house narrowly escaped from a set for Carmen, with crimson walls and a green wooden door framed with twisted pillars of dark green stone. The deeply projecting tiled roof spread like a fan over the typical corner balcony, and the walls tilted at angles that suggested false perspective". Like many another colonial house, it was built on Incaic foundations. Even under the Spaniards, most of the craftsmen were Indian and soon modified the Spanish style to something quite different from the prototype that had been taught them



Nearer to the sea than Cuzco, Lima was chosen as the Viceregal seat of Spanish rule in America. Its criollo (American-born Spanish) character and the imported Moorish influence are best seen in Torre Tagle palace (above), begun in 1715 ; now Peru's Foreign Office. Quinta da Presa (right), built by the Viceroy de Amat as a country-seat for his mistress La Perricholi, shows how Spanish 18th-century architecture adapted itself to Lima's climate





In 1611, at the height of its silver-mining days, 150,000 inhabitants made Potosí the largest city in the hemisphere. Now 40,000 people are engaged there in tin-mining. So far from the sea, Spanish influence was reduced, and Incaic tones predominate in art and architecture. Thus, whilst the statue of the saint in this portal screen of the Church of San Lorenzo is dressed in Spanish costume, the rest of the elaborate decoration is Indian, even to vases of the sacred Inca flower



Though Potosí mines provide most of the wealth of Bolivia, it is La Paz which reaps the benefit. Silver-mining in the colonial period served to enrich Spain and to build churches in Potosí itself; the profits of present-day tin-mining largely accrue to the Head Offices in La Paz and have made possible the remodelling of the city centre "in the international ennui of Plaster Modern". The only relics of its colonial past are caravanserais, used by lowland Indians, and one church



Potosí's wealth, whether colonial silver or modern tin, has always lain in the Cerro Rico (Rich Hill), which at one time produced as much silver as any three other known mines. The Casa della Moneda once minted the currency of the Spanish Empire and has now been restored to its original appearance. It is a "two-storey building of uncut yellow boulders and neat pink-brick trim . . . we were shown a museum so extensive that a guide was needed to prevent our getting lost. As a last exhibition, we went up onto the tiled roof, dotted by rows of domed sentry-boxes, to see a stunning view of the pink pyramid of Cerro Rico rising above the many belfries of Potosí"

From Arequipa to Cuzco took two days on an English-run train, a trip of great comfort in huge black-leather armchairs. The first day we climbed over a pass of 14,668 feet, where breathing was rather difficult, and on the second a pass of only 14,153 at La Raya (The Parting), beyond which all water flows into the great system of the Amazon. From there we followed the increasingly fertile valley of the Río Vilcanota past half-deserted villages of dilapidated adobe huts down to Cuzco. To the Indians the city's name signified The Navel of the World, and in this holiest and most important of their cities the Conquistadores built more churches than in any other of the same size. On the Plaza de Armas, formerly sacred to the Inca's creator-god, the Spaniards built four churches and the cathedral; while in the attempt to convert the Indians by converting their sacred places, the church of Santo Domingo was raised on the foundations of the Incaic House of the Sun.

Cuzco is fortunate in its cathedral. So many that we saw were vast 19th-century neo-classic constructions, frigid to look at and given to draughts. Cuzco's five-part façade has a renaissance design leading from the plain bell-towers to simple side doors and the climax of a rich central portal. The gilded interior may have seemed poor stuff to the Indians, by comparison with the gold plates that had lined their shrines but, in the style of Quito's San Francisco, it is every bit as handsome, and some beautiful baroque statues behind the high altar are particularly impressive, their swirling draperies given the illusion of actual motion by the flickering light of many candles.

On the south side of the plaza stands the Jesuit church of La Compañía, smaller and richer than the cathedral, with towers pierced by oval windows and topped by a froth of little cupolas and turrets. The adjoining house of the Jesuits has been taken over by the University, and in its simple cloister the students lounged while brightly-dressed Indians slowly paved the old flower-beds with blocks of pink granite. But the triumph of Cuzco's churches is La Merced, a masterpiece of crisp rustication and richly-patterned red stone. Paradoxically, the Incaic skill at stone-cutting that had built mortarless walls to withstand centuries of earthquakes was here turned to decoration and their skill as masons forgotten. Half the blocks of the great cloister were on the ground, and the rest were propped by a forest of poles while the tottering construction was being made sound. Stylistically unique, in

a city renowned for the fineness of its stone-cutting La Merced offered the finest.

We stayed in Cuzco many days, and each walk brought us to new surprises and delights. The plain house-fronts of the dingiest streets were broken by gaily-painted balconies, sometimes with grills like the masrabiyeys of Lima. Often there were imposing blocks of stone over or around the doors, some with Incaic designs of snakes or mermaids playing guitars, some more elaborate with the pillars and rosettes, the busts and ornate crests of a later date. One afternoon we came across a house narrowly escaped from a set for *Carmen*, with crimson walls and a green wooden door framed with twisted pillars of dark green stone. The deeply-projecting tiled roof spread like a fan over the typical corner balcony, and the walls tilted at angles that suggested false perspective. Decay was taking its toll of many old palaces, turned tenements in the course of time; but open doors showed patios bright with flowers in startling contrast to the severity of exterior walls.

After leaving Cuzco and driving south around Lake Titicaca, we passed through many villages of the old silver route from Potosí to Lima, each with its incongruously splendid church as relic of former glory. We stopped to investigate the one at Chucuito, to be told that we could not enter as the man who looked after it was working in the fields some miles away and would not return until evening. Hardly had our informant finished speaking, when a bent little old man hobbled up, unlocked the door of the church, and asked us to enter. He had dreamed the night before that we would come, he said, adding that he was most sorry to have kept us waiting. I found it difficult to look calmly at the denuded interior of a church which the night before I had not known to exist.

Tiahuanaco, just south of the lake, had reached the classical stage of its civilization around A.D. 900 and then vanished, leaving strewn across a muddy plain sculpture of great size and often considerable skill, as well as the remains of monolithic buildings with walls and doors decorated with intricate patterns of conventionalized birds and beasts. The present village was established in colonial times some distance from the ruins, and its huge and simple church of SS Peter and Paul, facing the main square, was built with stones from the remains. In front of it, to represent the patron saints, had been placed two quaintly subhuman antique figures dug from the ground by a lazy sculptor.

The influence of this culture could be seen farther south in La Paz, the highest of the

world's capitals and possibly the ugliest. We saw little remaining of the colonial period except the church of San Francisco, with a façade in a grand version of the Arequipa style, and some caravanserais used by the Indians bringing fruit and vegetables from the lowlands—great enclosed courtyards heaped high with bright oranges and tomatoes and sacks of grain, surrounded by rows of cubicles for storage or sleeping. However, the centre of the city has been remodelled, thanks to the great wealth of the tin mines, in the international ennui of Plaster Modern. The Tiahuanaco influence was apparent in the appliqué decoration of the new university and also in irresistibly comic bits all over and around the National Museum in a style having so little to do with its model that it did not even merit the title of Applied Archaeology—the same spirit that constructed the neo-Incaic museum in Lima of plaster, carved and painted to imitate the monolithic constructions of Cuzco but, alas, such as appeared in Lima at no period.

South-east from La Paz, twenty-two hours by train, is Potosí, the fabulous silver city, spread at the base of Cerro Rico (The Rich Hill) at the cold and uncomfortable altitude of 13,600 feet. The city was rumoured to have been the largest in the hemisphere when in 1611, at the peak of the silver mining, it boasted 150,000 inhabitants. Although the hill produced as much silver as any three other known mines, dug from a honeycomb of tunnels by Indians brought as forced labour from all parts of the Andean territory, eventually the silver ran out and 200 years later the city had shrunk to only 8000. Now the mining of tin occupies a population of 40,000 in this colonial town of brightly-painted houses and many churches. The intense hues of the buildings gave an illusion of warmth that our bones never felt, and the churches were a constant reminder of a glory that had passed.

Off the main plaza, we peered at the ornate façade of the church of the Bethlehemites to discover that *Stallion Road* was being played within under the title of *Mujer Indomita*. It sounded sexy either way, but we wandered down the street to see what was playing at the Ciné Skating, formerly the church of La Compañía, before going back to watch the triumph of love on a screen properly placed where the high altar had formerly stood. When the lights went up at the end of the film, we saw that boxes had been placed in the shallow niches of the side altars, and the whole painted a uniform dark blue. The church had adapted well, and it

was the only comfortably warm place in town.

Of the few churches open an hour or so a week, San Lorenzo at one end of the marketplace was the most interesting. Beside the dry-goods counters a large grill of gilded wood opened to a small court, at the end of which the plain towers of the church flanked a brilliant portal screen set under a deep barrel vault. The statue of the saint over the door was dressed for classic ballet, but the rest of the decoration was Indian—mermaids playing guitars, columns that grew into feather-skirted figures with arms akimbo, whose feather headdresses served as capitals, the sun and moon and hosts of stars, vases of the sacred Inca flower, and a pair of rampant putti—almost identical with the single preserved sketch of the high altar of the Incaic House of the Sun in Cuzco.

In the centre of town was the huge Casa de la Moneda, built in 1572, where the currency of the Spanish Empire had been minted. Recently restored as much as possible to its original appearance, it is a solid two-storey building of uncut yellow boulders and neat pink-brick trim. A florid crest over the main door is the sole decoration to relieve the severity of its exterior. Inside, over the arch leading from the first to the second of its large courtyards, a brightly-painted grape-wreathed head of Bacchus grinned down on the central fountain—hardly the presiding genius one might expect. In the many rooms of the old mint we were shown a museum so extensive that a guide was needed to prevent our getting lost. As a last exhibition, we went up onto the tiled roof, dotted by rows of domed sentry-boxes, to see a stunning view of the pink pyramid of Cerro Rico rising above the many belfries of Potosí.

Only the Casa de la Moneda and the neo-Roman cathedral were kept in repair. Near the station, a heap of rusting mine machinery was stored in the yard of a collapsing church. Fallen stones had not been replaced. Altarpieces were askew and their wood rotting. Walled in and forgotten, both church and machinery appeared to have been left to accomplish the last stages of their decay in seemly privacy. And the Indians, one felt, wanted it to hurry. However, a new gasoline pump had been raised just inside the gate. Leaving no time for remorse, a new *Conquista* was in full swing. La Paz had shown the way with traffic signs reading "No Coca-Cola Parking" and "One Coca-Cola Way—Drink it cold". The Indians were drinking it cold, and one day the empty bottles will spangle the heap in the churchyard.

A Map of Mexico City in 1550

by C. A. BURLAND, F.R.A.I.

OUR excuse for time-travelling in an old map of Mexico is that a new and rare book has been sent to us from Sweden. But why make an excuse? We enjoy old maps for their beauty and their liveliness. The present map is a facsimile of the parchment document preserved in the Library of the University of Uppsala, Sweden. It is the map about which Dr Sigvald Linné, Sweden's leading Americanist scholar, was commissioned to write the rare book. It is rare because the edition is limited to 700 copies, of which 600 have been presented to scientific institutions and interested individual students of American historical problems. This was done through the generosity of Dr Holger Graffman who defrayed the entire cost of the edition as a gesture of international friendship between Sweden and Mexico. The publishers are the Ethnographical Museum of Sweden, Stockholm, and the book is *El Valle y la Ciudad de Mexico en 1550*.

There have been retouched publications of this map before, but now the issue of a facsimile of high quality invites us all to join in a journey through the painted landscape and to view the busy life of Mexico four centuries ago.

It is only thirty-one years since Cortes first landed at Vera Cruz in 1519, but what a change has already spread over the ancient Aztec city of Tenochtitlan! In the countryside near at hand a few of the pyramid temples of the Aztec gods still stand, deserted and overgrown, while the villages now cluster round churches, each with a plaza and village-

cross beside it. In the city things are much more formal and Spanish. The terrible events of the siege of 1521 when the Spanish conquerors were forced to fight the Aztecs from house to house, demolishing every building as they captured it, are still marked by the rarity of old buildings, and by the rubble-grey areas where the ruins of old Tenochtitlan had been tumbled into the multitude of canals which once intersected that incredible city in a lake. Near the centre one landmark preserves its old site, the Plaza which lay south of the walls surrounding the great temple enclosure where, among other monuments, stood the terrible pyramid of the Aztec gods of War and Rain. On the map the pyramids are utterly invisible, blown up and levelled off by the Spaniards who knew only too well the horrors of human sacrifice that had once been enacted there. On the site of one of the smaller skull-racks where the heads of sacrificed enemy warriors once ministered to the pride of the Aztec war chiefs there is now a graceful renaissance cathedral.

The work on the cathedral had commenced in 1525 under the direction of Martin de Sepúlveda, and the first Mass was said in the building in the next year. It stood a little to

A map of "that incredible city in a lake", the Aztec Tenochtitlan which later became Mexico. It is said to have been drawn from a sketch by Cortes himself, the captor of the city, and was first published in the Latin edition of his letters to Charles V. It may be compared with the map of 1550 reproduced overleaf





All illustrations, except two, by courtesy of Statens Etnografiska Museum, Stockholm

A reduction of the map of Mexico City drawn between 1536 and 1550, from the facsimile in Dr S. Linne's treatise. The original is now preserved in the Library of the University of Uppsala, Sweden. The west,



s in the map on the preceding page, is at the top. Note that in the north-west a renaissance cathedral as replaced the Aztec temple to the gods of War and Peace. Subsequent pages show details of this map

the south of the present cathedral, and, astonishingly enough, was mainly erected by Indian labourers and masons who worked so well that the building was not demolished until after 1626 when the new cathedral had already been under construction for over fifty years. Tradition says that it had many arches in the three aisles, and that the Indians were happy while they worked with the stones supported by the wooden centering, but when the timbers had to be removed, at the completion of the work, they ran for their lives. Never having seen an arch with a keystone before, they could not understand how it would hold together. Afterwards they learned to build arches as well as any Spaniard, perhaps rather better for they were a race gifted with good taste to a high degree.

In the city we find all the churches and great houses are named. In the north (in this map the top is the west) we see the great church of Santiago Tlatelolco with its market-place and head of pure water brought by the native aqueduct from Chapultepec. In the centre we see above the cathedral the town hall, and below it the House of the Marquis (Hernando Cortes) which became the Viceregal residence. There is, however, no Spanish monopoly of dignity, for in the south-eastern corner of the city are two distinguished mansions: one, the House of Tapia,

belonged to a nephew of Montezuma, the last Aztec High Chief, and the other, the House of Paul, seems to have been the residence of Don Pablo Xochiquen, one of the early Aztec governors of the city.

It was a fine new city, probably finer than anything in Europe at the time. As early as 1524 Cortes was able to report that it contained 30,000 houses. Here was a remarkable achievement of town-planning, for the total destruction of the Aztec city left the Spaniards a ruin-strewn wilderness which they re-designed as a renaissance city. The quality of these men may be judged when we realize that there were less than 2000 Spaniards in the whole country at the time.

However, if you wish to visit the city you must go around it in 1554 with the Spanish scholar Francisco Cervantes Salazar who described it at that date. The painter of our map was not at his ease in the city. His delicate brushwork marks dignified and formal buildings, but within the whole built-up area he makes a drawing of only one man. There is no doubt that the artist was a Mexican Indian who has adapted much of the technique of ancient Mexican maps to the needs of the new mixed civilization. (See my article entitled *American Indian Map Makers* in the November 1947 number of this Magazine.) It is in the countryside that our artist is at



This illustration, like that opposite, is copied from the facsimile map of the city of Mexico in 1550 and shows the south-east corner. The canals survive from Aztec times, but the many open spaces betoken the reconstruction work which was building a renaissance city on the rubble of the totally destroyed Aztec Tenochtitlan. This was the residential area of the native Indian governors of the city and their fine houses Casa de Tapia and Casa de Pablo testify to the efforts of the Spanish crown to give fair treatment to its Mexican subjects. The little black bird painted over the Casa de Tapia may be the signature of the map artist



From Chapultepec, whose fresh-water spring still supplies Mexico City, goods are carried in ancient fashion by Indian traders on the back and with tump-line round the forehead; but in neighbouring fields herdsmen tend sheep, pigs and cattle, all new imports from the Spanish West Indies

home, among the green hills and woods, along the busy roads and on the cool waters of the Lake of Texcoco. He is bilingual, naming his villages with the old hieroglyphs as well as in the Spanish alphabet. The result of his fusion of styles has been singularly happy: there is no pompous formalism about the country in his map; instead it is filled with a life-portrait of the Valley of Mexico as he knew it. It has an almost cinematic quality—a documentary of Mexican life four centuries ago.

This country is still almost entirely Indian. In the painting one hardly realizes that a Spanish Viceroy is overlord of all these villages. Some of the Indians wear tunics, but most are dressed in the old loin-cloth, while the women we meet on the roads still wear the modest ankle-length gown of Aztec times. Only one woman wears colour; the preference seems overwhelmingly for white. On the whole map we see no wheeled vehicle. Transport remains, as it had been for thousands of years before the coming of the Spaniards,

confined to packs carried on the backs of men and supported by tump-lines round their foreheads. Some of these Indians are travelling on their own business, with their families. One rests leaning against his pack, with his wife and child beside him. Others, however, are followed by their masters, now Spaniards instead of Aztec warriors, but as before they are driven on by blows and threats.

In spite of the terrible death-roll of the Aztecs in the siege of Mexico the surrounding towns and villages are still well populated. (The map was drawn before the coming of the three epidemics which halved the population of the country in a generation.) The pressure of population on native food resources was as great as ever, largely because of the primitive agricultural methods of the Indians—the digging-stick is still the only plough in use on the map. On the lake fishermen work with three-pronged fish-spears and angle with hook and line; some even spread nets to catch the marsh birds (as their descendants do to this day), and in the hills west of the city



At the church of Santa Fé, Acaxochil, a festival is in progress and food is distributed to Indians and also to the clergy. In the background a Spaniard with drawn sword beats on his Indian porters. The only plough in use is a digging-stick and on the whole map there is no wheeled vehicle; but in the nearby woodland native foresters are cutting the timber with axes made of the steel newly introduced by the Spaniards

(Right) Indian life had not changed much by 1550. Pulque tapped from the cactus was the native liquor (as it still is). The Indians travel on trading expeditions carrying bundles and babies on their backs, while in the fields a boy uses his sling to catch birds. Even place-names are painted in hieroglyphs, the hill being named "seven eagle". (Below, left) The blow-gun is now obsolete in the Valley of Mexico, but its use was described by the Spanish conquerors: to shoot birds with clay pellets, not poisoned darts. (Below, right) The donkey was introduced by the Spaniards, and this seems the first representation of one in Mexican art. He eats a cactus and is beaten off by his Indian master, because this is a maguey cactus, from which pulque is brewed





The need for food in the Valley of Mexico bred many unusual devices, such as that of catching birds by spreading nets above the surface of the lake, a method still used to trap the small but tasty wading bird Chicuilotl



Ola Apenes



The Mexican Indian of today (left) who carries a roll of matting by making it into a pack on his back supported by a tump-line round his forehead is following a custom which was in use, as (above) a drawing from an Aztec manuscript shows, long before the Spanish Conquest

fowling-nets are spread between the trees. On one hill a man with his bow hunts deer, while boys with their slings can still add a few birds to the stew-pot, and one man is using his blow-gun to shoot birds.

The horse seems to remain something of a rarity: only four appear on the map, each ridden by an armed Spaniard. There is only one donkey, a little grey burro who was apparently taking a meal off a cactus when his Indian master began to beat him. Although the tiny drawing hints at a bridle, the burro is carrying no burden; yet it is difficult to imagine that the donkey was taken to Mexico for any other purpose than as a provider of labour and, when he died, to leave his hide to the tanner. Such was his role in old Spain, and in New Spain, as Mexico was called in those days, many Spanish folk-customs were adopted by the Indians and preserved almost unchanged to this day. Even dances and Passion Plays remain among the Mexicans in forms which the tourist imagines to be purely Indian, but which are really more akin to our own traditional customs such as Morris Dances and Mummers' Plays, than to anything known in Aztec Mexico.

In the whole map there is one wheel—a water-wheel installed in a stone mill. Its

purpose was probably to crush sugar-cane, or perhaps to grind the Spaniards' wheat. Both these important products were introduced from the West Indies by Cortes who wished to improve the standards of living of the Indians as some compensation for the change of rule. His influence, and in fact his understanding of Indian character, appear in the map in just this form of new subsistence activities. The most prominent are small herds of sheep, pigs and cattle. The ancient Mexicans only domesticated the dog and the turkey, apart from a few bird and animal pets. It is an interesting observation for those of us who would like to alter the structure of society overnight, that while the highly intelligent Mexicans adopted Spanish mills and pastoral practices, they continued grinding their own staple food, maize, on the old saddle-quern, and today in hundreds of country villages the women are up before sunrise crushing the grain with a heavy stone hand-roller on the old three-legged stone *metates*, as these saddle-querns are called.

Where the Spanish methods showed an obvious improvement on the native ones they were adopted. We see men on the map cutting trees and shaping wood with steel-bladed axes and adzes. These tools were already known to the Indians, who made them in

stone and bronze—the transition to steel was an improvement of an old implement, not a revolutionary change to something entirely unfamiliar.

The introduction of new foodstuffs to the Indians gave them a certain independence, and the Spanish landowners who wished to treat the natives as slaves had few good words to say about it. However, the Spanish Government and the Church were insistent in defending the rights of the natives, and capable village chiefs were often able to defend their people from the worst evils of oppressive feudalism. That the Indians did not revolt effectively was partly due to their inter-tribal jealousies. The last Aztec chief Cuauhtemoc was betrayed by the other Mexican chiefs: a story much like the events which followed the Roman conquest of Britain; but there the parallel ends. The contrast between the two peoples was far greater in México. A predatory city-state, Tenochtitlan, was overthrown at the beginning of its bronze age by an organized band of Europeans of the Renaissance with all the knowledge and advanced technology implied by that term. The Indian religion, so barbarous that the people themselves believed it was imposed on them by a devil, was utterly subverted in a matter of three years. In the place of the old temples of the gods the new churches on our map sprang up, attended by long-robed friars who led an austere life which the Indians regarded as the very quintessence of priestly excellence.

It was fortunate for the development of modern Mexico that in this period of the High Renaissance, with its pride and corruption, the Spaniards should have brought with them a band of devoted missionary friars who were more sincere and simple in their faith than almost any others in the world of those days. It was the new religion that gave the Indians some unity wider than even that of their ancient belief, but it was a unity expressed in Spanish culture, an austere aristocratic culture ideally suited to the genius of the Mexican Indian nobility.

At Acaxochil our artist shows a rather characteristic scene in the plaza outside the Church. A festival is being celebrated and a solemn distribution of food is taking place. The poor and the rich villagers share alike and the clergy are fed at a table in the cloister. Such scenes were still more common on the borders of the really savage hunting tribes of north-western Mexico. In their lands Archbishop Zumarraga instituted villages attached to monasteries, where everything was shared in common, and any

Indian who asked could enter the village and have a little house of mud brick set apart for himself and his family. The savage hunters found that the villagers grew food and lived well, they experienced the benefits of gifts of food, and of free hospital treatment if they were injured. The example of civilization reduced them to the quiet ways of village life. Once they had settled, the monks, following the example of Friar Peter of Ghent, taught the Indians useful handicrafts by which the village could earn a living and keep its independence. An interesting sidelight on the influence which led Archbishop Zumarraga to adopt this policy is seen in a book, new in his day, which still survives with copious annotations in the archbishop's own hand. It was *Utopia* by Thomas More.

We have seen in our map that the two streams of culture which were to make up modern Mexico had already merged. All seemed set for a Spanish-Indian civilization to develop. The reasons for the delay which held Mexico back until this century are another matter, outside the range of our map.

Finally, who was this delightful artist who has shown us through his own countryside? A Mexican Indian without doubt, because of his style of work, and a man of good family because he must have had some training as a scribe which enabled him to benefit from Spanish instruction at the one place he could have received it, the College of Holy Cross at Tlatelolco. This school for the Indian intellectuals was founded in 1536. However, our map was not drawn after 1555 because in that year a poor copy of it was engraved in the *Islario General* of Alonso de Santa Cruz. The figures on the map are strongly reminiscent of the paintings in the Techialoyan codices, painted in 1533 to assert the claims of the descendants of Montezuma to certain estates. We cannot, unfortunately, name our artist; the best we can do is to say that he was a close friend of the Mexican nobility of his day, and by his care in decorating the House of Tapia it would not be unreasonable to guess that he had some special relationship to Montezuma's nephew Don Andres de Tapia Motechiuh. One wonders if the little black bird on this house is the name-glyph of the artist. I myself think it reasonably certain that the map was designed and executed by one artist; the styles are consistent, as also is the completely different emotional approach to town and countryside. Whoever he was, he made a most delightful work that is still capable of pleasing and instructing the modern reader.